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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/492,231	01/27/2000	Ken-ichi Takatori	Q57674	9607

7590

07/21/2003

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2100 Pennsylvania Avenue
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EXAMINER

DUDEK, JAMES A

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/492,231

Applicant(s)

TAKATORI, KEN-ICHI

Examiner

James A. Dudek

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-92 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,7,9,10,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,73 and 75 is/are rejected.
- 7) ☒ Claim(s) 13,15,17,57-61,63,65-69,71,77-82 and 85-90 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are
2,4,6,8,11,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,64,70,72,74,76,83,84,91 and 92.

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DETAILED ACTION

Claim Objections

Claims 57-61, 63, 65-69, 71, 77-82, 85-90 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple must be in an alternative form and these claims are not in an alternative form. See MPEP § 608.01(n). Accordingly, the claims 57-61, 63, 65-69, 71, 77-82, 85-90 have not been further treated on the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 5, 9-10, 19, 21, 23, 25, 27, 33, 35, 45, 47, 49, 51, 53, 55, 71 and 73 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Itoh et al. ("496").

Per claim 1, 496 teaches an optical modulation element, comprising: a liquid crystal layer having a helix pitch [see column 15, line 40, 240 degree twist] and held between a pair of transparent substrates having opposing transparent electrodes see upper substrate 12, lower substrate 22, electrodes 14 and 24]; a white light source for sending white light onto a surface of one of said transparent substrates of said liquid crystal layer in an oblique direction [see figure 1 and paragraph bridging columns 3-4]; and at least one flat mirror arranged outside the other one of said transparent substrates to reflect the incident light transmitted through said liquid crystal layer toward said light source [see blaze mirror 31].

Per claim 3, 469 teaches an optical modulation element, comprising: a liquid crystal layer having a helix pitch [see column 15, line 40, 240 degree twist] and held between a pair of transparent substrates having opposing transparent electrodes see upper substrate 12, lower substrate 22, electrodes 14 and 24]; a white light source for sending white light onto a surface of

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one of said transparent substrates of said liquid crystal layer in an oblique direction [see figure 1 and paragraph bridging columns 3-4]; a first flat mirror arranged outside the other one of said transparent substrates of said liquid crystal layer to reflect the incident light transmitted through said liquid crystal layer in an incident direction thereof [see blaze mirror 31]; and a second flat mirror for reflecting the light reflected by said first flat mirror and by said liquid crystal layer in the incident direction thereof [see blaze mirror 31 and figure 10c, each separate surface of the prisms is considered a separate mirror; as ambient light is used, light would inherently be reflected of of one mirror (or one surface of a prism shown in 10c) towards the other mirror (or surface of the plurality of surfaces of the prisms shown in figure 10c)].

Per claim 5, 496 teaches an element according to claim 3, wherein said first and second flat mirrors form an integrated mirror having an L-shaped section, or a saw-toothed mirror [see figure 10].

Per claims 9 and 10, 496 teaches an element according to claims 1 or 3, wherein said transparent electrodes comprise transparent electrode groups divided into stripes such that a longitudinal direction thereof perpendicularly intersects an incident surface group of the incident white light [see figure 1 and stripe electrodes 14 and stripe electrodes 24 running perpendicular to 14].

Per claim 19, 496 teaches an element according to claim 3, wherein an output optical path of a circularly polarized light beam having a selected wavelength and reflected by a liquid crystal surface of one of said transparent substrates and an output optical path of a circularly polarized light beam having a selected wavelength and reflected by said first and second flat mirrors and the other one of said transparent substrates overlap each other at least partially [the reflectors of 496 reflect all visible light and thus will at least partially reflect circular polarized light having a selective wavelength].

Per claims 21 and 23, 496 teaches an element according to claims 1 or 3, wherein a medium having a refractive index lower than that of said liquid crystal is inserted at least one of

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between said transparent substrates and said mirror and between said transparent substrates and said incident surface of the incident light [see 53].

Per claims 25 and 27, 496 teaches an element according to claims 1 or 3, wherein said liquid crystal has a helix axis substantially perpendicular to a substrate surface.

Per claims 73 and 75, 496 teaches a device according to claim 53 and 55, which performs field sequential display [this is intended use].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 7, 29, 31, 37, 39, 41, 43, are rejected under 35 U.S.C. 103(a) as being unpatentable over 496.

Per claim 7, 496 teaches an element according to claim 5, but lacks said saw-toothed mirror and the other one of said transparent substrates are integrally formed. However, it was well known to integrate a reflecting surface with the substrate in order to eliminate a layer and thus decrease the thickness of the over all display. Accordingly, it would have been obvious to one of ordinary skill at the time the invention was made to integrate the mirror and substrate.

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Per claims 29 and 31, 496 teaches an element according to claims 1 and 3, but lack “said liquid crystal has a helix axis substantially parallel to a substrate surface.” However, it was well known to use ferroelectric or antiferroelectric liquid crystal in order to improve response time. Accordingly, it would have been obvious to one of ordinary skill at the time the invention was made to 496 with ferroelectric material.

Allowable Subject Matter

Claims 13, 15, and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

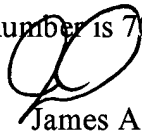
Per claim 13 and its associated dependent claims, 496 teaches an element according to claim 3, but lacks “an output optical path of a circularly polarized light beam having a selected wavelength and reflected by a liquid crystal surface of one of said transparent substrates, and an output optical path of a circularly polarized light beam having a selected wavelength and reflected by said first and second flat mirrors and the other one of said transparent substrates do not overlap each other.”

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Dudek whose telephone number is 308-4782. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7721 for regular communications and 703-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



James A. Dudek
Primary Examiner
Art Unit 2871

July 14, 2003